Delirium is a prevalent, costly, and global problem in older adults. This article is a systematic review of the literature on nurse recognition of delirium. Ten articles, reporting rates of nurse recognition ranging from 26% to 83%, were included in the review. The most compelling finding is that although related, the notions of nurse knowledge of delirium, nurse recognition of delirium, and nurses’ assessment and documentation of delirium in older adults are different. Recommendations for practice are suggested at several levels, including education, guidelines, communication, health care system, and use of informatics.

Melinda R. Steis, MS, RN; and Donna M. Fick, PhD, RN

Search Methods

We conducted a comprehensive review of the literature on all original research articles reporting sources of data published through June 2007 using the following databases: MEDLINE, CINAHL, PsycINFO, and ProQuest Psychology Journals. Search terms included delirium or acute confusion and
nurses, recognition, identification, nurse recognition, or nurse identification. Selection criteria were that the article was in English and reported primary data. Exclusion criteria were non-English articles, studies not reporting primary data, and studies that did not include measurement of nurse recognition of delirium. For example, some studies were excluded because they measured only physician recognition of delirium.

Ten articles were selected for the final systematic review (Figure). Articles were reviewed and graded by the two authors (M.R.S. and D.M.F.) using the Modified Scale to Assess Quality of Studies (Chalmers et al., 1981; Elie, Cole, Primeau, & Bellavance, 1998), which considered aspects of design, measures, sampling, and analysis. Possible scores range from 0 (low quality) to 16 (high quality), with results of this review ranging from 4 to 14. When differences occurred in two of the study quality scores, the raters discussed the areas of disagreement and rescored the studies, reaching accordance on the rating. We also used evidence grading by Harbour and Miller (2001), the levels for which range from A to D. The studies in this review were all classified as level C or D (Table).

RESULTS
We compiled and reported the results, including rates of nurse recognition of delirium, assessment, documentation, and other pertinent findings. A listing of the characteristics of the studies is detailed in the Table.

Description of Methods
Definitions and Measures. The Diagnostic and Statistical Manual of Mental Disorders (APA, 1980, 1987, 1994) was used as the standard to define delirium. With the exception of one study (Fick, Hodo, Lawrence, & Inouye, 2007), the researchers accepted nurses’ documentation of any of the domains of delirium as satisfactory evidence that nurses recognized delirium. Rarely was the term delirium included in the nurses’ documentation. For example, “records were reviewed retrospectively on a patient’s discharge from the hospital for documentation about the diagnosis of delirium, or reference to this clinical problem using one or more of the myriad synonyms or by a description of the patient’s behavior via clinical indicators or symptoms of delirium” (Milisen et al., 2002, p. 25).

The instrument used to assess delirium varied greatly. In the 8 studies measuring a patient population, 4 used the Confusion Assessment Method (CAM) (Bowler et al., 1994; Inouye, Foreman, Mion, Katz, & Cooney,
2001; Inouye et al., 2005; Milisen et al., 2002), and each of the following were used once: Abbreviated Mental Test score (Young & George, 2003), Delirium Symptoms Interview (DSI) (Morency, Levkoff, & Dick, 1994), modified Organic Brain Syndrome scale (Gustafson, Brännström, Norberg, Bucht, & Winblad, 1991), and case vignettes (Fick et al., 2007). The case vignettes were designed after performing a literature review of delirium and delirium superimposed on dementia. The vignettes were subsequently reviewed by a geropsychiatric and finally by an expert panel of four physicians and nurse experts to assess content validity and expert agreement.

**Definition of Populations.** Studies that used the patient as the unit of analysis included older adults at least older than age 60 who were enrolled regardless of a diagnosis of dementia. One study used the nurse as the unit of analysis (Fick et al., 2007). This was a convenience sample of medical-surgical nurses with a mean age of 40, an average of 14 years of experience, and with 65% having at least a bachelor’s degree (Fick et al., 2007). Morency et al. (1994) partially informed of their nurse population: 92% had a bachelor’s degree or higher and were working within a primary nursing model with 24-hour accountability for patients. Surprisingly, Eden and Foreman (1996) found no correlation between nurse recognition of delirium and the educational or experience levels of the nurses in their sample. No other nurse populations were described.

**Rates of Nurse Recognition of Delirium**

When using direct measurement designs by comparing clinical assessments with gold standard definitions, nurse recognition of delirium ranged from 26% to 83%. Retrospective chart reviews to compare the nurses’ documentation of delirium with the assessments made by the research team yielded 38.7% (Gustafson et al., 1991), 56.9% (Bowler et al., 1994), 26% (Young & George, 2003), 83.1% (Laurila, Pitkala, Strandberg, & Tilvis, 2004), and 26% (Inouye et al., 2005). Paired ratings by nurses and researchers yielded 31% (Inouye et al., 2001). A case study set in an intensive care unit comparing interviews of nurses, chart audits, and patient observations yielded 50% nurse recognition of delirium (Eden & Foreman, 1996).

Nurse recognition of delirium was also measured indirectly and by hospital day. Morency et al. (1994) reported the level of recognition according to each domain of delirium, ranging from 41% for the perceptual domain to 81% for the disorientation domain. Milisen et al. (2002) reported nurse recognition of delirium after patient hip surgery; rates ranged from 87.5% on the first postoperative day to 50% on the twelfth postoperative day. Presentation of case vignettes to nurses in a classroom setting yielded nurse recognition of 41% for hypoactive delirium alone, 54% for hyperactive delirium alone, and 21% for hypoactive delirium superimposed on dementia (Fick et al., 2007). No relationship was found between correct responses on the case vignettes and nurses’ years of experience, specialty, or education (Fick et al., 2007).

**Inadequate Assessment and Documentation**

In 7 of the studies, the authors suggested that although nurses assessed their patients, they did not perform a detailed enough evaluation and subsequent documentation to accurately report their patients’ cognitive status. For example, Milisen et al. (2002) wrote that, “although nurses’ clinical notes contained information about patients’ cognitive status, the documentation of patients’ mental status was seldom accurate” (p. 27).
Nurse Knowledge of Delirium
Two studies included a measure of nurse knowledge of delirium. The first formally measured geropsychiatric knowledge with the Mary Starke Harper Aging Knowledge Examination (MSHAKE) (Fick et al., 2007). Although the nurses scored well on the MSHAKE, they did not score highly on the case vignettes. Young and George (2003) included an educational intervention for one of three study groups, with results providing evidence that guidelines alone do not effect change. When education of staff and management guidelines were coupled, there was some improvement in the process of care and the outcomes of the patients with delirium. Milisen et al. (2002) concluded that nurses “knew” what confusion was but when asked specifically to define it, they did not consistently report the same understanding. However, Fick et al. (2007) reported that nurses correctly stated some of the causes of delirium.

Communication
An acute observation was made by the research assistants in Morency et al.’s (1994) study. They used the DSI, which dictates patient questioning as well as observation to detect the domains of delirium. They attempted to make the patient feel at ease, then proceeded to ask if the patient had any unusual thoughts or experiences. The responses were often an admission that patients were afraid to reveal this to anyone for fear of being labeled as “crazy.” This portrays one circumstance in which nurse-patient and nurse-nurse communication is critical. This information is vital to the understanding of the lack of nurse recognition of fluctuating behavior—a key domain of delirium. Inouye et al. (2001) similarly reported that patient compliance was mistakenly accepted as an indication of intact mental status.

Nurses reported frustration in reporting symptoms to physicians without receiving helpful guidance in return (Eden & Foreman, 1996). If physicians are not responding to nurses’ reports of symptoms of delirium (and physicians typically do not read nurses’ notes), communication between nurses and physicians may be a barrier to recognizing delirium (Bowler et al., 1994; Laurila et al., 2004).

In 6 of the articles (Gustafson et al., 1991; Inouye et al., 2001, 2005; Laurila et al., 2004; Morency et al., 1994; Young & George, 2003), caregivers were asked questions about the patients’ history of cognitive functioning. This information was essential to establish the patient’s cognitive baseline, as well as reveal any recent changes experienced by the patient. Families notice the subtle changes in the patient, especially when the patient is experiencing hyperactive delirium.

Risk Factors for Underrecognition of Delirium in Older Adults
The presence of hypoactive delirium, age 80 or older, vision impairment, and dementia are reported risk factors for the underrecognition of delirium in older adults (Fick et al., 2007; Inouye et al., 2001; Milisen et al., 2002). Inouye et al. (2001) found that when all four of these factors are present, the risk of underrecognition increased 20-fold.

DISCUSSION
The most compelling finding in this review is that although related, the concepts of nurse knowledge of delirium, nurse recognition of delirium, and how nurses assess and document delirium in older adults are different. According to the Merriam-Webster Online Dictionary (n.d.a), knowledge is a familiarity, awareness, or comprehension acquired by experience or study, and recognition (n.d.b) is the awareness that something perceived has been perceived before. This means that knowledge precedes recognition. Delirium is a complex set of symptoms that fluctuate within a 24-hour period. Clinical research has helped articulate the subtleties of delirium during the past 2 decades. If nurses have not been explicitly taught the nuances of how delirium is manifested in older adults, they cannot be expected to readily recognize it at the bedside.

Measuring nurse recognition of delirium in these studies proved to be more complex than previously thought. The directness and complexity of the measures for delirium, as well as the design and settings, differed. With the exception of one, all of the studies reported low rates of nurse recognition of delirium, implying nurses have a lack of knowledge. Subsequently, what are nurses recognizing? They recognize that their patients are in distress, that they are confused, that they are exhibiting inappropriate or different behavior, and that they need help. Without knowledge of a template or framework in which to place these symptoms, nurses will not progress to actually recognizing delirium.
### Table

**CHARACTERISTICS OF ARTICLES INCLUDED IN THE SYSTEMATIC REVIEW OF NURSE RECOGNITION OF DELIRIUM IN OLDER ADULTS**

<table>
<thead>
<tr>
<th>Author (Year), Country</th>
<th>Population, Sample</th>
<th>Delirium Measure</th>
<th>Design/Method</th>
<th>Evidence Grade&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gustafson et al. (1991), Sweden</td>
<td>Two prospective samples: age $\geq 65$; $n = 111$ and $n = 57$; Two retrospective samples: age $\geq 65$; $n = 66$ and $n = 68$</td>
<td>DSM-III</td>
<td>Two prospective clinical studies</td>
<td>C2</td>
</tr>
<tr>
<td>Morency et al. (1994), United States</td>
<td>$N = 325$, age $\geq 65$, in Boston hospital</td>
<td>DSM-III</td>
<td>Prospective observational</td>
<td>C2</td>
</tr>
<tr>
<td>Bowler et al. (1994), United Kingdom</td>
<td>$N = 201$, age $\geq 60$</td>
<td>DSM-III</td>
<td>Census/questionnaire (two stage)</td>
<td>D</td>
</tr>
<tr>
<td>Eden &amp; Foreman (1996), United States</td>
<td>$N = 1$, 69-year-old man</td>
<td>DSM-IV</td>
<td>Case study</td>
<td>D</td>
</tr>
<tr>
<td>Inouye et al. (2001), United States</td>
<td>$N = 797$, age $\geq 70$</td>
<td>DSM-III</td>
<td>Prospective comparison of nurse and researcher ratings</td>
<td>C2</td>
</tr>
<tr>
<td>Milisen et al. (2002), Belgium</td>
<td>$N = 55$, age $\geq 65$, convenience sample from two trauma units</td>
<td>DSM-III</td>
<td>Retrospective chart review</td>
<td>C2</td>
</tr>
<tr>
<td>Young &amp; George (2003), United Kingdom</td>
<td>$N = 211$, age $\geq 65$, 18.5% from institutions</td>
<td>DSM-IV</td>
<td>Quasi-experimental intervention study</td>
<td>C2</td>
</tr>
<tr>
<td>Laurila et al. (2004), Finland</td>
<td>$N = 219$, age $\geq 70$, 40.2% with dementia, 35.2% with delirium, and 81.3% living at home</td>
<td>DSM-IV</td>
<td>Point prevalence</td>
<td>C2</td>
</tr>
<tr>
<td>Inouye et al. (2005), United States</td>
<td>$N = 919$, age $\geq 70$</td>
<td>DSM-III</td>
<td>Prospective validation</td>
<td>C2</td>
</tr>
<tr>
<td>Fick et al. (2007), United States</td>
<td>$N = 29$ medical-surgical nurses from Georgia</td>
<td>Case vignettes</td>
<td>Case vignettes</td>
<td>D</td>
</tr>
</tbody>
</table>

<sup>a</sup> Evidence grades ranged from A (at least one meta-analysis, systematic review, or randomized controlled trial rated as 1++ and directly applicable to the target population or a systematic review of randomized controlled trials or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population and demonstrating overall consistency of results) to D (evidence level 3 or 4 or extrapolated evidence from studies rated as 2+).

<sup>b</sup> Quality score was determined using the Modified Scale to Assess Quality of Studies. Scores range from 0 (low quality) to 16 (high quality).

Results

| Comparison I: Physicians documented 24 of 111 (21.6%) patients as confused in their records. Nurses identified 43 of 111 (38.7%) patients as confused. Neither the physicians nor nurses documented any attempt to test the patients’ cognitive function. | Quality Score | 10 |
| Comparison II: Physicians documented 5 of 57 (8.8%) patients as confused. Nurses identified and documented 17 of 57 (29.8%) patients as confused. 14 had clear statements of Acute Confusional State (ACS), 3 had notations indicating ACS. Nurses’ diagnoses of ACS were combined with notes on nursing activities. Physicians and nurses often used a vague and inconsistent terminology to describe patients’ mental state. Terms such as “senile,” “rapid postoperative development of dementia in a previously healthy man,” “messy,” “muddled,” and “confused” were used. | | |
| The sensitivity of the various domains required to diagnose delirium were: disorientation: 0.81, consciousness disturbance: 0.61, perceptual disturbance: 0.41, speech disturbance: 0.51, sleep-wake cycle disturbance: 0.67, increased or decreased psychomotor activity: 0.64, fluctuating behavior: 0.56. | | 10 |
| 56.9% of the delirium cases detected by the research interview were correctly identified by the nurses. | | 9 |
| 50% nurse recognition of delirium. | | 4 |
| Nurses identified delirium in only 19% of observations and 31% of patients, compared with researchers. Nearly all disagreements between nurse and researcher ratings were because of underrecognition of delirium by the nurses. | | 14 |
| Nurses charted about the cognitive status of patients but never used the word delirium. Hypoactive delirium was the least recognized subtype. | | 10 |
| Nurses recognized 26% of patients with delirium. | | 9 |
| At least two signs of confusional state were recorded by nurses in 83.1% of the cases. Delirium was equally poorly identified among patients with and without concomitant dementia. | | 6 |
| Comparison of a chart-based method for identification of delirium with direct interviewer assessment using CAM. 26% false negative because of lack of documentation of delirium symptoms. | | 11 |
| 21% were able to correctly identify hypoactive delirium superimposed on dementia, 41% correctly identified hypoactive delirium alone. Nurses were most likely to correctly identify dementia and hyperactive delirium and least likely to recognize the hypoactive form of delirium superimposed on dementia or hypoactive delirium alone. | | 12 |

There were several limitations of this review, namely, the heterogeneity of studies reviewed, weak study designs of some of the research, and varying methods of assessment of delirium and dementia. Although the patient was most often the unit of measurement, describing both patient and nurse populations would enhance these studies.

**TRANSLATING DELIRIUM RECOGNITION INTO PRACTICE**

What factors make it difficult to translate nurse recognition of delirium into practice? This review of the literature uncovered some of these barriers. For nurses to recognize delirium, they need time with patients, knowledge of the key features of delirium, an objective instrument to guide their assessment and documentation of delirium, and the support of leadership within the organization.

The studies in this review range in date from 1991 through 2007. Despite almost 2 decades of research, the rates of nurse recognition are still poor. It is imperative we act now to improve nursing practice in this area. Recommendations for practice are needed at several levels, including delirium assessment education, improved nurse-nurse communication, changes to the health care system, and the use of computerized decision support. In addition, we recommend wide implementation of delirium position statements and practice protocols. Several guidelines promoting routine cognitive assessment have been published; some suggest assessment of mental status should be the sixth vital sign (Australian Society for Geriatric Medicine, 2006; Dharmarajan, 2007; Flaherty et al., 2007; Potter, George, & Guideline Development Group, 2006).

**Education**

Three major nursing audiences are of concern: nursing students, nursing faculty, and practicing nurs-
KEYPOINTS

NURSE RECOGNITION OF DELIRIUM


1 These studies suggest nurses are missing key symptoms of delirium and appear to be performing only superficial mental status assessments.

2 Although related, the concepts of nurse knowledge of delirium, nurse recognition of delirium, and nurses' assessment and documentation of delirium in older adults are different.

3 If nurses have not been explicitly taught the nuances of how delirium is manifested in older adults, they cannot be expected to readily recognize it at the bedside.

4 For nurses to recognize delirium, they need time with patients, knowledge of the key features of delirium, use of an objective instrument to guide assessment and documentation, and the support of leadership within the organization.

es. Nearly 60% of newly licensed nurses care for older adults ages 65 to 85, and more than 22% care for the adult population older than age 85 (Smith & Crawford, 2004). Progress is being made. From 1999 to 2002, newly licensed nurses reported gaining more clinical experience in nursing homes, home health care, rehabilitation, and critical care—all settings that typically host a higher percentage of older adults (Smith & Crawford, 2004). There are existing recommended guidelines for including geriatric nursing in baccalaureate nursing curricula, which is a start, but these recommendations are not mandatory (American Association of Colleges of Nursing & The John A. Hartford Foundation Institute for Geriatric Nursing, 2000).

One cannot assume bedside nurses will seek out, read, and incorporate into practice new information from research articles. Offering concise, accurate segments of knowledge may potentially reach the nurses who are caring for the older adult population. Examples of educational resources are the Try This: Best Practices in Nursing Care to Older Adults series provided by The John A. Hartford Foundation Institute for Geriatric Nursing (http://www.hartfordign.org/resources/education/tryThis.html) and the Building Academic Geriatric Nursing Capacity Web site (http://www.geriatriccns.org/collaborative/hgni.asp), which highlights the Hartford Geriatric Nursing Initiative, created collaboratively by the Hartford Institute, the American Academy of Nursing, and the American Association of Colleges of Nursing.

Communication and Use of Information Technology

Because delirium has a fluctuating course over a 24-hour period and often includes a change in cognition or the development of a perceptual disturbance, routine cognitive assessment and nurse-nurse communication is critical in early recognition of delirium. First, nurses must understand the relevance of performing the cognitive assessment on every shift, then become skilled at interviewing the patient, and finally, understand and follow through with consistent communication of the assessment findings (Eden & Foreman, 1996). Intershift report is a hand-off point when nurses could inadvertently omit or miscommunicate information. Intershift report maintains the primary function of oral communication of the patients’ pertinent information, with a goal of seamless quality of care for patients (Bourne, 2000; Kerr, 2002).

These points are valid and well taken but are worthless if the information transferred at the change of shift does not effectively inform oncoming nurses of pertinent data needed to provide quality patient care (Bourne, 2000). Communication and documentation will be enhanced with the regular use of a cognitive assessment instrument. Where electronic health records are available, a cognitive assessment instrument should be incorporated as an interactive component. Use of information technology to assess causes of delirium and manage the behaviors associated with delirium is currently being piloted by one of the coauthors (D.M.F.).

Health Care System

System variables that may influence nurses’ recognition of delirium include staffing, leadership, hospital culture, and degrees of interdisciplinary collaboration. Health care systems need to move toward adopting elder-friendly atmospheres, similar to past efforts to make children’s hospitals more “kid friendly.” Goals of this kind of effort should be to support the older adults to maintain independence by helping compensate for physical and cognitive losses, early detection and intervention, targeting return to the usual living space, open communication, support for end-of-life care, and respect and care for caregivers (Dvorsky & Petti pas, 2007; McCutcheon, 2002). Service upgrades should include promotion of a multidisciplinary approach with access to a range of health care professionals, more intensive rehabilitation
services, a holistic approach to treatment, and recognition that older adults will have a longer recovery period—all of which involve a change in culture and leadership values within the organization (McCutcheon, 2002).

The studies reviewed in this article suggest nurses are missing key symptoms of delirium and appear to be doing superficial mental status assessments. This makes it difficult to distinguish delirium from other conditions common to older adults, such as dementia. At the health system level (Estabrooks, Midodzi, Cummings, & Wallin, 2007), a well-known instrument such as the CAM should be adopted for universal use. The CAM assesses four features:

- Acute onset and/or fluctuating course.
- Inattention.
- Disorganized thinking.
- Altered level of consciousness.

A positive delirium screen using the CAM requires the first, second, and third or fourth features be present (Inouye et al., 1990). The CAM has been used in a variety of settings and is amenable for use at the bedside.

**Future Research**

Clarifying the concept of recognition will facilitate future research. Is documentation of symptoms without confirmation that the nurse understands that the condition is delirium adequate to claim that the nurse has recognized delirium? Research on nurse recognition of delirium and management of delirium should occur across settings, including the community, home health care, and long-term care. Fick et al. (2007) reported that 21% of the nurses in the study attributed dementia and hypoadaptive delirium superimposed on dementia to normal aging. This highlights the need to further research nurses’ attitudes toward older adults and confused older adults. Future research should also concentrate on how nurses approach mental assessment, exploring the factors that facilitate and hinder assessment.

**SUMMARY**

This systematic review is an important update on nurse recognition of delirium. Nurses do not properly assess, recognize, document, or communicate about older adults with delirium. Effective education and system improvements for nurses related to delirium in older adults will be the first step to address this problem and move toward earlier recognition of and improved management of delirium in this vulnerable population.

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ABOUT THE AUTHORS

Ms. Steis is a doctoral candidate and Graduate Research Assistant, and Dr. Fick is Associate Professor, School of Nursing, College of Health and Human Development, and Associate Professor, School of Medicine, Department of Psychiatry, The Pennsylvania State University, University Park, Pennsylvania.

Address correspondence to Melinda R. Steis, MS, RN, Graduate Research Assistant, School of Nursing, College of Health and Human Development, The Pennsylvania State University, 203 Health and Human Development East, University Park, PA 16802; e-mail: msw156@psu.edu.